TABLES 28.575—ROLL FACTORS—Continued

B/d	X
3.3	0.84
3.4	0.82
3.5	0.80

Note. Intermediate values must be obtained by interpolation.

C_b	Y
0.45	0.75
0.50	0.82
0.55	0.89
0.60	0.95
0.93	0.97
0.70	1.0

Note. Intermediate values must be obtained by interpolation.

$100A_k/(LB)$	k
0	1.0
1.0	0.98
1.5	0.95
2.0	0.88
2.5	0.79
3.0	0.74
3.5	0.72
4.0	0.70

Note. Intermediate values must be obtained by interpolation.

T	S
6	0.100
7	0.098
8	0.093
12	0.065
14	0.053
16	0.044
18	0.038
20	0.035

Note: Intermediate values must be obtained by interpolation.

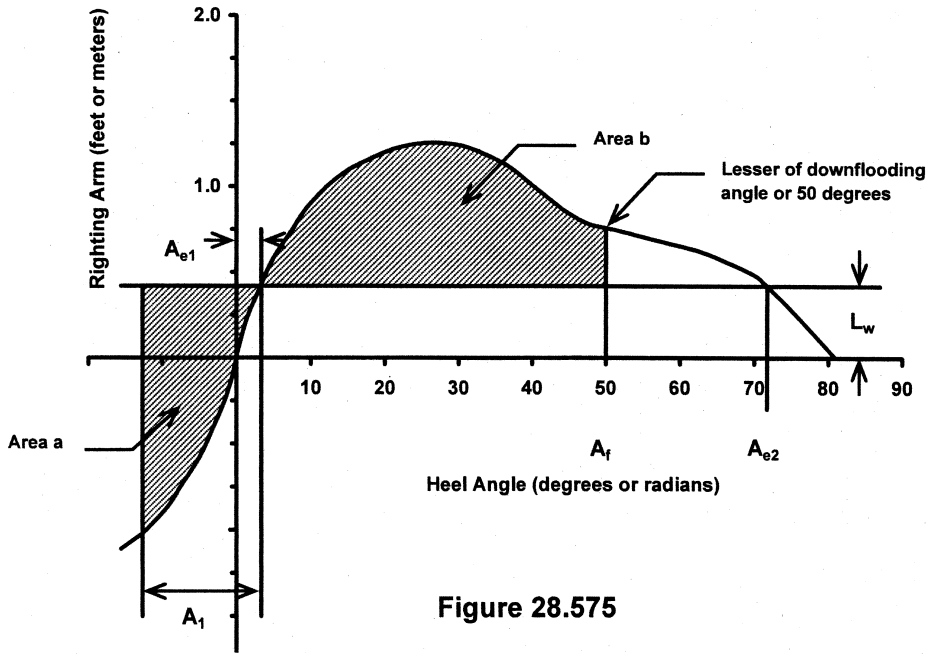


Figure 28.575

[56 FR 40393, Aug. 14, 1991, CGD 88–079; 56 FR 47679, Sept. 20, 1991, CGD 88–079, as amended by CGD 95–072, 60 FR 50461, Sept. 29, 1995; USCG-2004–18884, 69 FR 58344, Sept. 30, 2004; USCG–2008–0906, 73 FR 56509, Sept. 29, 2008]

§ 28.580 Unintentional flooding.

(a) *Applicability*. Except for an open boat that operates on protected waters and as provided by paragraph (i) of this section, each vessel built on or after September 15, 1991 must comply with the requirements of this section.

(b) *Collision bulkhead.* A watertight collision bulkhead must be fitted and must meet the following:

(1) Openings in the collision bulkhead must be kept to a minimum, and each must be fitted with a watertight closure device;

(2) A collision bulkhead must not be fitted with a door below the bulkhead deck;

(3) A penetration or opening in a collision bulkhead must be—

(i) Located as high and as far inboard as practicable; and

(ii) Fitted with a means to rapidly make it watertight which is operable from a location aft of the collision bulkhead;

(4) The collision bulkhead must be located at least 5 percent of the length from the forward perpendicular unless the vessel has a bulbous bow, in which case the forward reference point will be extended by half the distance between the vessel's forward perpendicular and the forwardmost point of the bulbous bow as shown in figure 28.580; and

(5) The collision bulkhead must not be stepped below the bulkhead deck.

(c) Each vessel must meet the survival conditions in paragraph (f) of this section in each condition of loading and operation with the extent and character of damage specified in paragraphs (d) and (e) of this section.

(d) *Extent and character of damage.* Except where a lesser extent of damage or a smaller penetration would be more disabling, in evaluating the damage stability of a vessel the following penetration must be assumed:

(1) Longitudinal extent—L/10, or 10 feet (3.05 meters) plus 0.03L, whichever is less. Transverse watertight bulkheads that are separated by at least this distance may be assumed to remain effective;

(2) Transverse extent—30 inches (0.76 meters) from the side measured at right angles to the centerline at the level of the deepest operating waterline; and

(3) Vertical extent—from the baseline upward without limit.

(e) Each space containing a through hull fitting, such as the lazarette and the engineroom, must be assumed to be flooded.

(f) *Survival conditions.* A vessel is presumed to survive the assumed damage and unintentional flooding described in paragraphs (d) and (e) of this section if:

(1) The angle of equilibrium after flooding does not exceed 25° (0.44 radians); and

(2) Through an angle of 20° (0.35 radians) beyond the angle of equilibrium after flooding, the following are met—

(i) The righting arm curve is positive;

(ii) The maximum righting arm is at least 4 inches (102 millimeters);

(iii) Each submerged opening is capable of being made weathertight; and

(iv) The heeling arm caused by deploying all fully loaded davit-launched survival craft on one side of a vessel does not exceed the righting arm at any angle of heel beyond the equilibrium angle when launching is assumed on the damaged side.

(g) *Permeability.* The permeability of each space must not be less than the following:

(1) For an accommodations space—95 percent;

(2) For a propulsion machinery space—85 percent;

(3) For a tightly packed storage space—60 percent;

(4) For a void or an auxiliary machinery space—95 percent;

(5) For an empty fish hold—95 percent;

(6) For a full fish hold—50 percent; and

(7) For tanks—95 percent (less if a tank must be full to attain the draft under consideration.)

(h) *Buoyancy of superstructure.* A deckhouse or a superstructure may be included in the buoyant volume of a vessel provided it is:

(1) Sufficiently strong to withstand the impact of waves;

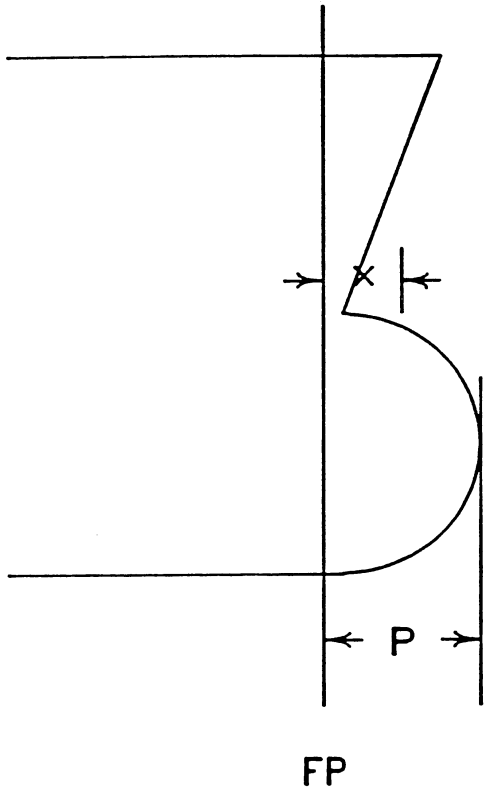
(2) Fitted with a weathertight or watertight closure device for each opening;

(3) Equipped with an efficient, hinged, inside deadlight, for each window and each portlight, arranged so that it can be effectively closed watertight; and

(4) Fitted with interior access from the spaces below.

(i) A vessel may obtain and maintain a Load Line Certificate under subchapter E of this chapter in lieu of

meeting the requirements of paragraphs (c) through (g) of this section.



$x = P/2$

Figure 28.580

[CGD 88–079, 56 FR 40393, Aug. 14, 1991; 56 FR 47679, Sept. 20, 1991, as amended by CGD 88–079, 57 FR 364, Jan. 6, 1992]